Patent claims

1. An active-matrix display containing a chiral smectic liquid-crystal mixture, wherein the liquid-crystal mixture comprises at least one compound of the formula (I)

$$R^1\text{-}(A^1\text{-}M^1)_a\text{-}(A^2\text{-}M^2)_b\text{-}A^3\text{-}X\text{-}B^1\text{-}(B^2)_c\text{-}R^2 \qquad (I)$$

where the symbols are as defined below:

R^1, R^2 are, independently of one another, identical or different and are each

a) hydrogen, fluorine or CN

a straight-chain or branched alkenyl, alkenyloxy, alkyl or alkyloxy radical (with or without asymmetric carbon atoms) having 2 to 16 carbon atoms, where

b1) one or two nonterminal $-CH_2-$ groups may be replaced by -O-, -OC(=O)-, -(C=O), -C(=O)O-, $-Si(CH_3)_2-$, -CH(Cl)- and/or one or two $-CH_2-$ groups may be replaced by -CH=CH- or -C≡C-

and one or more H atoms may be replaced by F and/or

b2) one or more $-CH_2-$ groups may be replaced by phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by F), phenylene-1,3-diyl (unsubstituted, monosubstituted or disubstituted by F), cyclohexane-1,4-diyl (unsubstituted or monosubstituted by F or CN) or cyclopropane-1,2-diyl

and one or more H atoms may be replaced by F

with the provisos that only one of the radicals R^1, R^2 can be hydrogen, F or CN and that two adjacent $-CH_2-$ groups cannot be replaced by -O-

M^1, M^2 are, independently of one another, identical or different and are each

-C(=O)O-, -OC(=O)-, $-CH_2O-$, $-OCH_2-$, $-CF_2O-$, $-OCF_2-$, $-CH_2CH_2-$, $-CF_2CF_2-$, -CH=CH-, -CH=CF-, -CF=CF-, -C≡C-, $-CH_2CH_2C(=O)O-$, $-OC(=O)CH_2CH_2-$, $-(CH_2)_4-$,

$-OCH_2CH_2CH_2-$, $-CH_2CH_2CH_2O-$, $-OCH_2CF_2CH_2-$, $-CH_2CF_2CH_2O-$ or a single bond

A^1, A^2, A^3 are, independently of one another, identical or different and are each cyclohexane-1,4-diyl (unsubstituted or monosubstituted by F, CH_3, CN), cyclohex-1-ene-1,4-diyl, cyclohex-2-ene-1,4-diyl, 2-oxocyclohexane-1,4-diyl, 2-cyclohexen-1-one-3,6-diyl, 1-alkyl-1-silacyclohexane-1,4-diyl, bicyclo[2.2.2]octane-1,4-diyl, spiro[4.5]decane-2,8-diyl, spiro[5.5]undecane-3,9-diyl, phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH_3, CF_3, OCH_3, unsubstituted, monosubstituted, disubstituted, trisubstituted or tetrasubstituted by F), phenylene-1,3-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH_3, CF_3, OCF_3, unsubstituted, monosubstituted, disubstituted, trisubstituted or tetrasubstituted by F), thiophene-2,5-diyl, thiophene-2,4-diyl, (1,3,4)-oxadiazole-2,5-diyl, (1,3,4)-thiadiazole-2,5-diyl, 1,3-thiazole-2,5-diyl, 1,3-thiazole-2,4-diyl, (1,3)-oxazole-2,5-diyl, isoxazole-2,5-diyl, indane-2,6-diyl, naphthalene-2,6-diyl (unsubstituted, monosubstituted or disubstituted by F or CN), 1,2,3,4-tetrahydronaphthalene-2,6-diyl, decaline-2,6-diyl, pyrimidine-2,5-diyl (unsubstituted or monosubstituted by F), pyridine-2,5-diyl (unsubstituted, monosubstituted or disubstituted by F), pyrazine-2,5-diyl (unsubstituted or monosubstituted by F), pyridazine-3,6-diyl, quinoline-2,6-diyl, quinoline-3,7-diyl, isoquinoline-3,7-diyl, quinazoline-2,6-diyl, 5,6,7,8-tetrahydroquinazoline-2,6-diyl, quinoxaline-2,6-diyl, 1,3-dioxane-2,5-diyl (unsubstituted or monosubstituted by CN), benzothiazole-2,6-diyl, piperidine-2,4-diyl, piperazine-1,4-diyl

B^1 is cyclohexane-1,4-diyl (unsubstituted, monosubstituted or disubstituted by F, CH_3, CN), perfluorocyclohexane-1,4-diyl, cyclohex-1-ene-1,4-diyl, cyclohex-2-ene-1,4-diyl, 1-alkyl-1-silacyclohexane-1,4-diyl, bicyclo[2.2.2]octane-1,4-diyl, cyclopentane-1,3-diyl, cycloheptane-1,4-diyl, tetrahydrofuran-2,5-diyl, tetrahydrofuran-2,4-diyl, phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH_3, CF_3, OCF_3, unsubstituted, monosubstituted, disubstituted, tri-

substituted or tetrasubstituted by F), phenylene-1,3-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH_3, CF_3, OCF_3, unsubstituted, monosubstituted, disubstituted or trisubstituted by F), thiophene-2,5-diyl (unsubstituted or monosubstituted by F), thiophene-2,4-diyl (unsubstituted or monosubstituted by F), 1,3-thiazol-2,5-diyl (unsubstituted or monosubstituted by F), 1,3-thiazol-2,4-diyl (unsubstituted or monosubstituted by F), (1,3,4)-thiadiazol-2,5-diyl, 1,3-dioxane-2,5-diyl (unsubstituted or monosubstituted by CN), tetrahydropyran-2,5-diyl, 6,6-difluorotetrahydro pyran-2,5- diyl, 6,6-difluoro-2,3-dihydro-6H-pyran-2,5-diyl, 6-fluoro-3,4-dihydro-2H-pyran-2,5-diyl, piperidine-1,4-diyl, piperazine-1,4-diyl, pyrimidine-2,5-diyl (unsubstituted or monosubstituted by F), pyridine-2,5-diyl (unsubstituted or monosubstituted by F), 1,2,3,4-tetrahydronaphthalene-2,6-diyl, decaline-2,6-diyl

B^2 is cyclohexane-1,4-diyl (unsubstituted, monosubstituted or disubstituted by F, CH_3, CN), cyclohex-1-ene-1,4-diyl (unsubstituted or monosubstituted by F), cyclohex-2-ene-1,4-diyl, 1-alkyl-1-silacyclohexane-1,4-diyl, bicyclo[2.2.2]-octane-1,4-diyl, phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH_3, CF_3, OCF_3, unsubstituted, monosubstituted, disubstituted, trisubstituted or tetrasubstituted by F), phenylene-1,3-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH_3, CF_3, OCF_3, unsubstituted, monosubstituted, disubstituted or trisubstituted by F), thiophene-2,5-diyl, thiophene-2,4-diyl, 1,3-thiazole-2,5-diyl, 1,3-thiazole-2,4-diyl, (1,3,4)-thiadiazole-2,5-diyl, 1,3-dioxane-2,5-diyl (unsubstituted or monosubstituted by CN), tetrahydrofuran-2,5-diyl, tetrahydropyran-2,5-diyl, 6,6-difluoro-tetrahydropyran-2,5-diyl, 6,6-difluoro-2,3-dihydro-6H-pyran-2,5-diyl, 6-fluoro-3,4-dihydro-2H-pyran-2,5-diyl, pyrimidine-2,5-diyl (unsubstituted or monosubstituted F), pyridine-2,5-diyl (unsubstituted or monosubstituted F), indane-2,6-diyl, piperidine-1,4-diyl, piperazine-1,4-diyl, pyrimidine-2,5-diyl (unsubstituted or monosubstituted by F)

X is $-(CH_2)_n-$, where

a) one or two $-CH_2-$ groups may be replaced by -O- or -C(=O)- and/or

b) one $-CH_2CH_2-$ group may be replaced by -CH=CH- and one or more H of the $-CH_2-$ groups may be replaced by F

with the provisos that

1) n is 2, 3 or 4

2) two adjacent $-CH_2-$ groups cannot be replaced by -O-

a, b, c are each zero, 1 or 2, with the provisos that

1) a must be 1 when R^1 is hydrogen, F or CN

2) the sum of a+b+c is at least 1

3) the radicals A and M, respectively, in the brackets may be identical or different when the corresponding index is 2.

2. An active-matrix display as claimed in claim 1, containing a liquid-crystal layer in the form of a monodomain having an unambiguously defined direction of the layer normal z of the SmC phase, where the layer normal z and the preferential direction n of the nematic or cholesteric phase (N* phase) form an angle of more than 5°, and the liquid-crystal layer is composed of a ferroelectric (chiral smectic) liquid-crystal mixture comprising at least one compound of the formula (I).

3. A display as claimed in claim 1 or 2, wherein the liquid-crystal mixture has a spontaneous polarization of $< 200\ nC/cm^2$ and DT (15,1) is > 20.

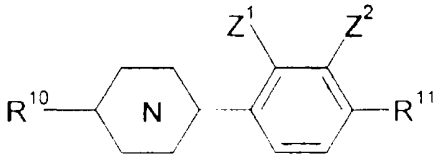
4. A display as claimed in one of claims 1 to 3, wherein, in (I),
X is $-OC(=O)-$, $-OCH_2-$ or $-OC(=O)CH_2CH_2-$.

5. A display as claimed in one of claims 1 to 4, wherein, in (I),
B^1 is cyclohexane-1,4-diyl, cyclohex-1-ene-1,4-diyl, phenylene-1,4-diyl, unsubstituted, monosubstituted or disubstituted by F, or thiophene-2,5-diyl.

6. A display as claimed in one of claims 1 to 5, wherein, in (I),

A^1 is pyrimidine-2,5-diyl (unsubstituted or monosubstituted by F), pyridine-2,5-diyl (unsubstituted or monosubstituted by F), phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by F), or (1,3,4)-thiadiazol-2,5-diyl.

7. A display as claimed in one of claims 1 to 6, wherein the liquid-crystal mixture is composed of 3 to 30 compounds and comprises at least one compound of the formula (I) and at least one compound of the formula (II) below and, if desired, at least one compound of the formula (III) below



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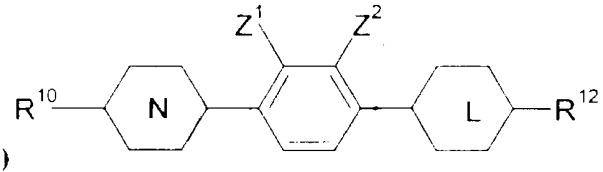
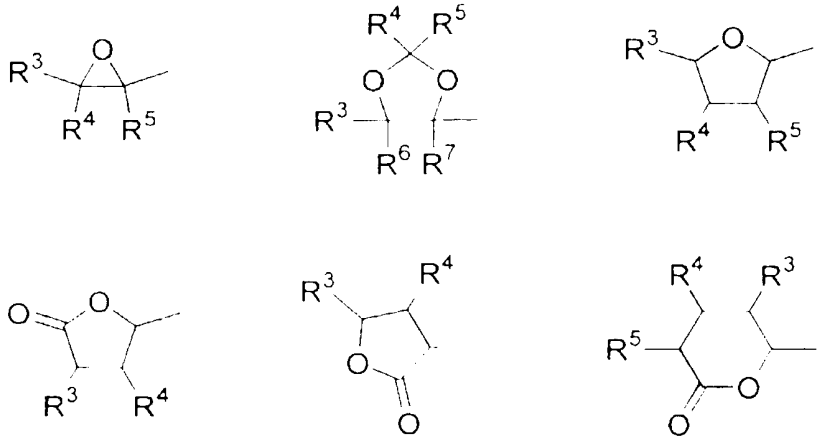
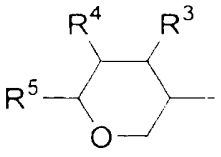
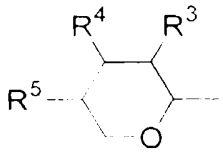
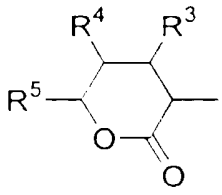
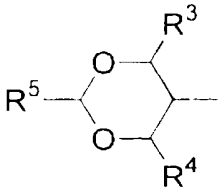
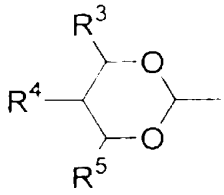
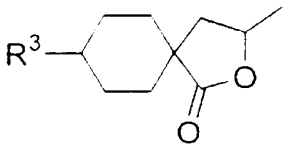
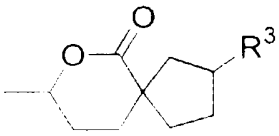
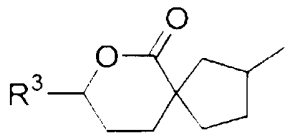
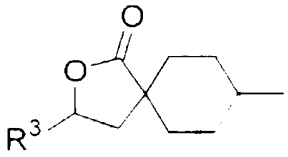
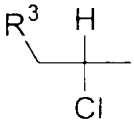
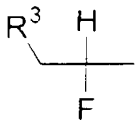
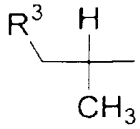
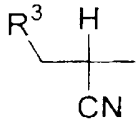
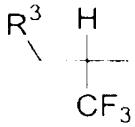


(III)

where:

R^{10}, R^{11} are as defined for R^1, R^2, where additionally the terminal $-CH_3-$ group may in each case be replaced by one of the chiral groups (optically active or racemic) below:




5

R^3, R^4, R^5, R^6, R^7 are identical or different and are each

a) hydrogen

b) a straight-chain or branched alkyl radical (with or without asymmetric carbon atoms) having 1 to 16 carbon atoms, where

b1) one or more nonadjacent and nonterminal CH_2 groups may be replaced by -O- and/or

b2) one or two CH_2 groups may be replaced by -CH=CH-,

c) R^4 and R^5 together may alternatively be $-(CH_2)_4-$ or $-(CH_2)_5-$ if they are attached to an oxirane, dioxolane, tetrahydrofuran, tetrahydropyran, butyrolactone or valerolactone system;

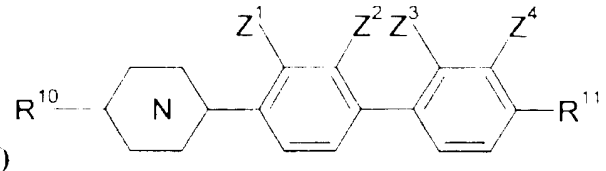
R^{12} is hydrogen or a straight-chain or branched alkyl radical (with or without asymmetric carbon atoms) having 1 to 16 carbon atoms, where one or more H may be replaced by F and one or two non-adjacent nonterminal $-CH_2-$ groups may be replaced by -O-

Z^1, Z^2, Z^3, Z^4, Z^5, Z^6 are each, independently of one another, H or F

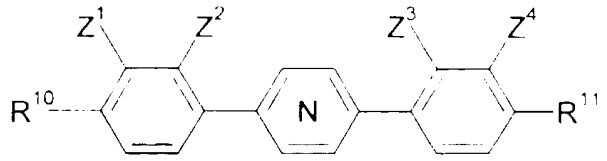
is a bivalent radical selected from the group consisting of pyridine-2,5-diyl, unsubstituted or monosubstituted by F, pyrimidine-2,5-diyl, unsubstituted or monosubstituted by F, pyrazine-2,5-diyl, unsubstituted or monosubstituted by F,

is a bivalent radical selected from the group consisting of cyclohexane-1,4-diyl, unsubstituted or monosubstituted by CN, CH_3, or disubstituted by F, cyclohex-1-ene-1,4-diyl, perfluorocyclohexane-1,4-diyl, cyclohex-2-ene-1,4-diyl, 1-alkyl-1-silacyclohexane-1,4-diyl, bicyclo[2.2.2]octane-1,4-diyl.

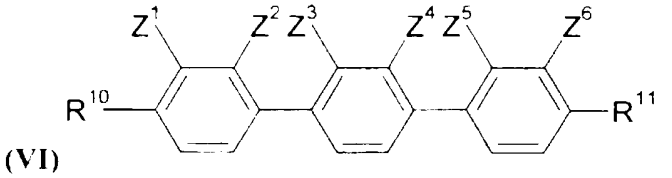
8. A display as claimed in one of claims 1 to 6, wherein the liquid-crystal mixture is composed of 3 to 30 compounds and comprises at least one compound of the formula (I) and at least one compound of the formula (II) and at least one additional compound, selected from the group consisting of (III), (IV), (V), (VI), (VII), where the compounds of the formulae (II) and (III) are as defined in claim 7,



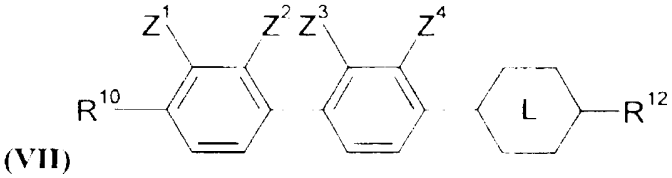
(IV)



(V)



(VI)

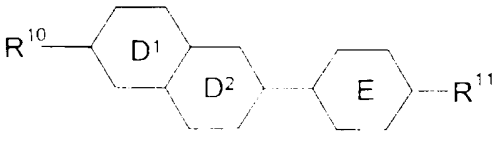


(VII)

where the symbols and indices are as defined in claim 7.

9. A display as claimed in one of claims 1 to 8, wherein the liquid-crystal mixture is composed of 3 to 30 compounds and comprises at least one compound of the formula (I) and at least one compound of the formula (II) and at least one additional compound selected from the group consisting of (VIII), (IX), (X), (XI), (XII), (XIII), (XIV), (XV), (XVI), (XVII), where the compounds of the formulae (II) and (III) are as defined in claim 7,

(VIII)



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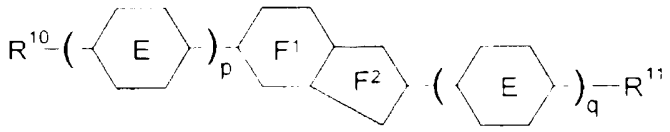
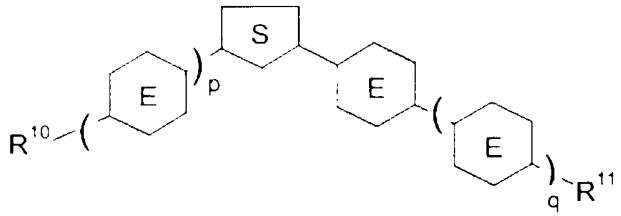


(X)



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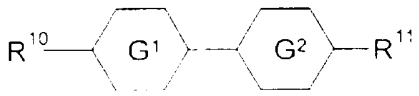
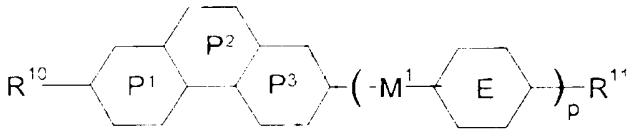


(XII)



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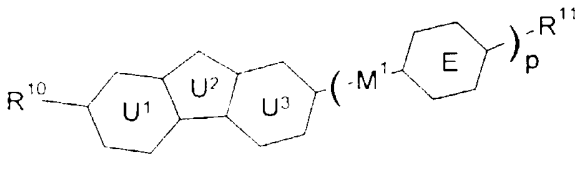

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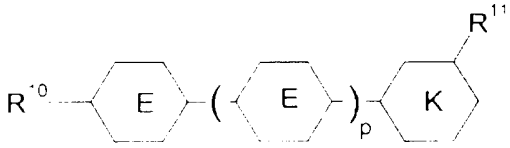
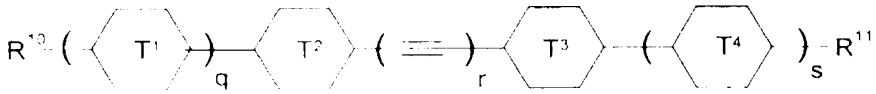
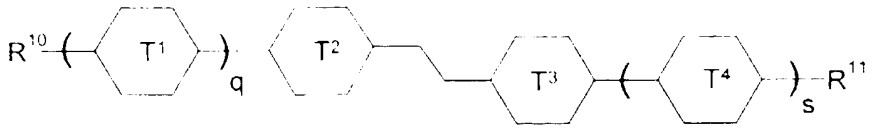


(XV)

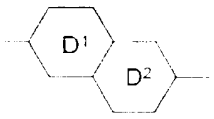


(XVI)



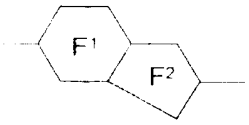
(XVII)

where the symbols and indices are as defined in claim 7 or as defined below:



is a bivalent radical selected from the group consisting of naphthalene-2,6-diyl, in which one or two ring carbon atoms may be replaced by N and which can be monosubstituted or disubstituted by F or CN and in which D^1 or D^2 may also be a (saturated) alicycle

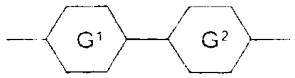
is a bivalent radical selected from the group consisting of phenylene-1,4-diyl, unsubstituted, monosubstituted or disubstituted by CN, or unsubstituted, monosubstituted, disubstituted, trisubstituted or tetrasubstituted by F, pyridine-2,5-diyl, unsubstituted or monosubstituted by F, pyrimidine-2,5-diyl, unsubstituted or monosubstituted by F, cyclohexane-1,4-diyl



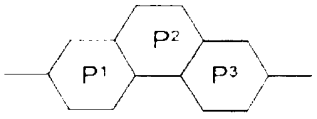
is a bivalent radical selected from the group consisting of indane-2,5-diyl, unsubstituted, monosubstituted or disubstituted by F in the aromatic ring, indan-1-one-2,6-diyl, unsubstituted, monosubstituted or disubstituted by F in the aromatic ring, benzothiazole-2,6-diyl, benzothiazole-2,5-diyl, benzo[b]-thiophene-2,5-diyl, benzo[b]thiophene-2,6-diyl

is a bivalent radical selected from the group consisting of (1,3,4)-thiadiazole-2,5-diyl, (1,3)-thiazole-2,5-diyl, thiophene-

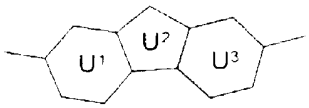
2,5-diyl, (1,3,4)-oxadiazole-2,5-diyl, (1,3)-oxazole-2,5-diyl, isoxazole-2,5-diyl



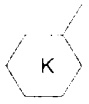
is a bivalent radical selected from the group consisting of 1,1'-biphenyl-4,4'-diyl, unsubstituted, monosubstituted or disubstituted by CN, or unsubstituted, monosubstituted, disubstituted, trisubstituted or tetrasubstituted by F, 1,1'-phenylcyclohexyl-4,4'-diyl, 5,5'-pyridylpyrimidine-2,2'-diyl, unsubstituted or monosubstituted by F in one or both of the heterocycles, 5,2'-pyridylpyrimidine-2,5'-diyl, unsubstituted or monosubstituted by F in one or both of the heterocycles, 1,2'-phenyldioxane-4,5'-diyl, 1,2'-(2-fluorophenyl)dioxane-4,5'-diyl, 1,2'-(3-fluorophenyl)dioxane-4,5'-diyl, 1,2'-(2,3-difluorophenyl)dioxane-4,5'-diyl



is a bivalent phenanthrene-2,7-diyl radical in which one or two ring carbon atoms may be replaced by N and which may be monosubstituted, disubstituted, trisubstituted or tetrasubstituted by F and in which P^2 and/or P^3 may be a (saturated) alicycle



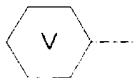
is a bivalent fluorene-2,7-diyl radical in which the $-CH_2-$ group in U^2 may be replaced by -C(=O)-, -CHF- or $-CF_2-$



is a bivalent radical selected from the group consisting of phenylene-1,3-diyl, unsubstituted, monosubstituted or disubstituted by F, cyclohexane-1,3-diyl, unsubstituted or monosubstituted by F or CN, pyridine-2,6-diyl, pyridine-2,4-diyl, pyridine-3,5-diyl, pyridine-4,6-diyl, pyrimidine-4,6-diyl,

is a bivalent radical selected from the group consisting of phenylene-1,4-diyl, unsubstituted, monosubstituted or disubsti-

tuted by CN or F, naphthalene-2,6-diyl, in which one or two ring carbon atoms may be replaced by N and which may be monosubstituted or disubstituted by CN or F, cyclohexane-1,4-diyl, cyclohex-1-ene-1,4-diyl, bicyclo[2.2.2]octane-1,4-diyl, (1,3)-dioxane-2,5-diyl, pyridine-2,5-diyl, unsubstituted or monosubstituted by F, pyrimidine-2,5-diyl, unsubstituted or monosubstituted by F, (1,3,4)-thiadiazole-2,5-diyl, indane-2,5-diyl, unsubstituted, monosubstituted or disubstituted by F in the aromatic ring, thiophene-2,5-diyl



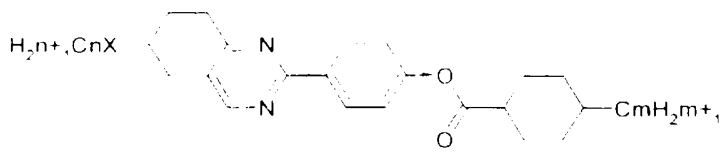
is a bivalent radical selected from the group consisting of phenylene-1,4-diyl, unsubstituted, monosubstituted or disubstituted by CN or F, naphthalene-2,6-diyl, in which one or two ring carbon atoms may be replaced by N and which may be monosubstituted or disubstituted by CN or F, cyclohexane-1,4-diyl, cyclohex-1-ene-1,4-diyl, bicyclo[2.2.2]octane-1,4-diyl, (1,3)-dioxane-2,5-diyl, indane-2,5-diyl, unsubstituted, monosubstituted or disubstituted by F in the aromatic ring, thiophene-2,5-diyl

p, q, s are each zero or 1
r is 1 or 2.

10. A chiral smectic liquid-crystal mixture as claimed in one of claims 1 to 7, comprising from 10 to 60% of one or more compounds of the formula (I).

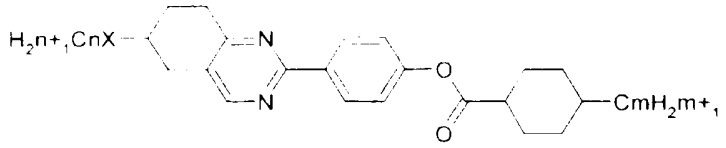
11. A chiral smectic liquid-crystal mixture as claimed in claim 7, comprising from 10 to 60% of 1 to 15 compounds of the formula (I) and from 40 to 90% of 2 to 15 compounds of the formula (II).

12. A compound of the general formula (I) as claimed in claim 1, selected from compounds of the formula (XX), where:



where n is an integer from 2 to 10
m is an integer from 3 to 10
X is a single bond or O,
with the exception of n=5, m=4, X=single bond

compounds of the formula (XXI), where:



is pyridine-2,5-diyl, 2-fluoropyridine-3,6-diyl, 4-fluoro-pyrimidine-2,5-diyl or phenylene-1,4-diyl, unsubstituted, mono-substituted or disubstituted by F

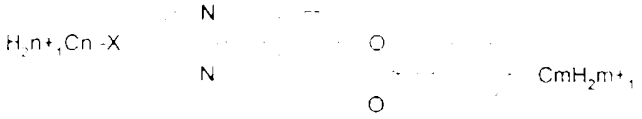
is pyridine-2,5-diyl, 2-fluoropyridine-3,6-diyl, 4-fluoro-pyrimidine-2,5-diyl or phenylene-1,4-diyl, unsubstituted, mono-substituted or disubstituted by F

with the provisos that a) one of the rings W^1/W^2 must be one of the nitrogen-containing heterocycles or

b) W^1-W^2 is undirected and 3-fluorobiphenyl-4,4'-diyl, 2-fluoro-biphenyl-4,4'-diyl or 2,3-difluorobiphenyl-4,4'-diyl

n is an integer from 1 to 14
m is an integer from 1 to 14
X is a single bond or O,

compounds of the formula (XXII), where:



n	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	10	10	11	12	13	13	13	13	13
m	6	7	8	9	10	11	3	4	5	6	7	8	9	10	11	6	11	6	6	4	5	6	7	8
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

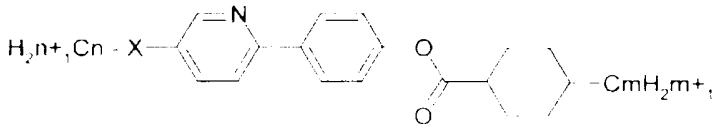
n	13	13	13	14	14	14	14	14	14	7	7	7	7	7	7	7	7	7	8	8	8	8	
m	9	10	11	5	6	7	9	10	11	3	4	5	6	7	8	9	10	11	4	7	8	9	
X	-	-	-	-	-	-	-	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O	

n	8	8	9	9	9	9	9	9	9	9	9	10	10	10	10	10	10	10	11	11	11		
m	10	11	11	3	4	6	7	8	9	10	11	3	6	7	8	9	10	11	3	4	6		
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O		

n	11	11	11	11	11	12	12	12	12	12	12	12	12	13	13	13	13	13	13	13	13	14	14
m	7	8	9	10	11	3	4	6	7	8	9	10	11	3	4	5	6	7	8	9	10	11	3	4
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	14	14	14	14	14	14	14
m	5	6	7	8	9	10	11
X	O	O	O	O	O	O	O

compounds of the formula (XXIII), where:



5

n	9	9	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10	10	11	11	11	11	11	11	11
m	3	4	5	6	7	8	9	10	11	3	4	6	7	8	9	10	11	12	5	6	7	8	9	10	11
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

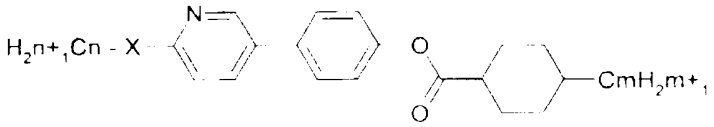
n	12	12	12	12	12	12	12	13	13	13	13	13	13	13	13	13	14	14	14	14	14	14	
m	4	6	7	8	9	10	11	3	4	5	6	7	8	9	10	11	3	4	5	6	7	8	
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

n	14	14	14	14	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	8	8
m	9	10	11	12	3	4	5	6	7	8	9	10	11	12	3	4	5	6	7	8	9	10	11	12	3	4
X	-	-	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10	10
m	5	7	8	9	10	11	12	3	4	5	6	7	8	9	10	11	12	3	4	5	6	7	8	9	10	11
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	11	11	11	11	11	11	11	11	11	11	12	12	12	12	12	12	12	12	12	13	13	13	13	13	13
m	3	4	5	6	7	8	9	10	11	12	3	4	5	6	7	8	9	10	11	12	3	4	5	6	7	8
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

compounds of the formula (XXIV), where:



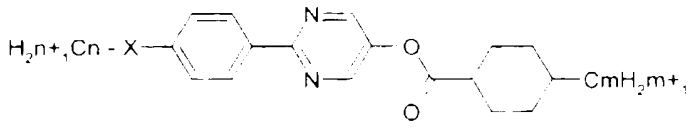
n is an integer from 8 to 14

m is an integer from 3 to 11

X is a single bond

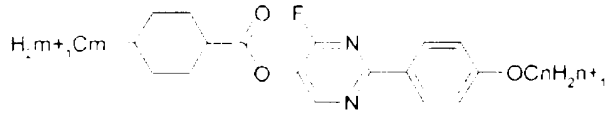
with the exception of n=11, m=3 or 5, X is a single bond,

compounds of the formula (XXV), where:



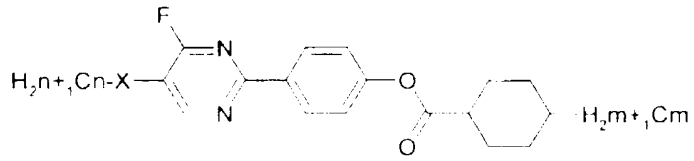
n is an integer from 2 to 13
m is an integer from 3 to 11
X is O or a single bond
with the exception of n=2, m=11, X=O; n=5, m=5, X=O,

compounds of the formula (XXVI), where:



n is an integer from 5 to 13
m is an integer from 3 to 10
with the exception of n=8, m=5,

compounds of the formula (XXVII), where:



n	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10
m	3	4	6	7	8	9	10	3	4	5	6	7	8	9	10	11	3	4	5	6	7	8	9	10
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

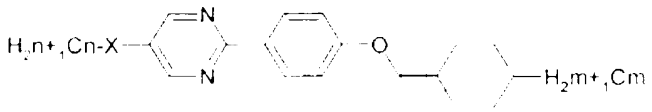
n	11	11	11	11	11	11	11	11	12	12	12	12	12	12	12	12	12	13	13	13	13	13	13	
m	3	4	5	6	7	8	9	10	3	4	5	6	7	8	9	10	11	3	4	5	6	7	8	
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

n	13	13	13	14	14	14	14	14	14	14	14	7	7	7	7	7	7	7	7	8	8	8	8
m	9	10	11	3	4	5	6	7	8	9	10	3	4	5	6	7	8	9	10	11	3	4	6	7
X	-	-	-	-	-	-	-	-	-	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O

n	8	8	8	8	9	9	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10	11	11	11
m	8	9	10	11	3	4	5	6	7	8	9	10	11	3	4	5	6	7	8	9	10	3	4	5
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	11	11	11	11	11	11	11	12	12	12	12	12	12	12	12	13	13	13	13	13	13	13	13	13
m	6	7	8	9	10	11	12	3	4	5	6	7	8	9	10	3	4	5	6	7	8	9	10	11
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

compounds of the formula (XXIX), where:



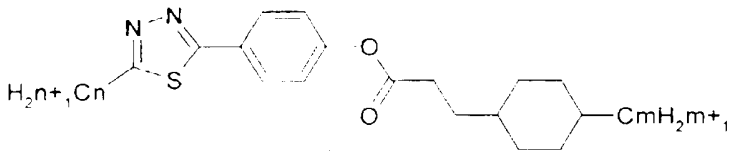
n	6	6	6	7	7	7	7	7
m	7	8	9	4	6	8	9	10
X	-	-	-	-	-	-	-	-

n	8	8	9	9	9	9	9	9	9	10	10	10
m	8	10	3	4	6	7	8	9	10	8	9	19
X	-	-	-	-	-	-	-	-	-	-	-	-

n	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7
m	3	4	6	7	8	9	10	3	4	5	6	7	8	9	10
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	8	8	8	8	8	8	8	8	9	9	9	9	9	9	10	10	10	10	10	10	10
m	3	4	5	6	7	8	9	10	5	6	7	8	9	10	4	5	6	7	8	9	10
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

compounds of the formula (XXX), where:

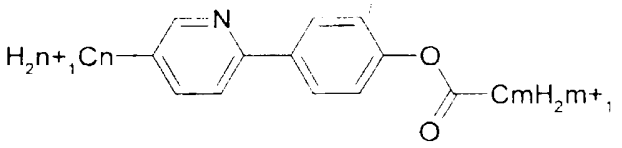


n is an integer from 5 to 13

m is an integer from 3 to 10

with the exception of n=8, m=4; n=9, m=3.

13. A compound of the general formula (II) as claimed in claim 7, selected from compounds of the formula (XXXI), where:



n	10	10	10	10	10	10	10	10	10	10	11	11	11	11	11	11	11	11	11	11	12	12	12	12
m	3	4	5	6	7	8	9	10	11	12	3	4	5	6	7	8	9	10	11	12	3	4	5	6
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

n	12	12	12	12	12	12	13	14	14	14	14	14	14	14	14	14	6	6	6	6	6	6	6	6
m	7	8	9	10	11	12	3	4	5	6	7	8	9	10	11	12	3	4	5	6	7	8	9	10
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	O	O	O	O	O	O

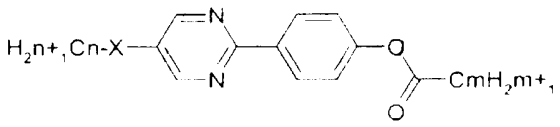
n	6	6	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	9	9	9
m	11	12	3	4	5	6	7	8	9	10	11	12	3	4	5	6	8	9	10	11	12	3	4	5
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10	10	10	11	11	11	11	11	11	11
m	6	7	8	9	10	11	12	3	4	5	6	7	8	9	10	11	12	3	4	5	6	7	8	9
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	11	11	11	12	12	12	12	12	12	12	12	12	12	13	13	13	13	13	13	13	13	13	13	14
m	10	11	12	3	4	5	6	7	8	9	10	11	12	3	4	5	6	7	8	9	10	11	12	3
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	14	14	14	14	14	14	14	14	14
m	4	5	6	7	8	9	10	11	12
X	O	O	O	O	O	O	O	O	O

compounds of the formula (XXVIII), where:



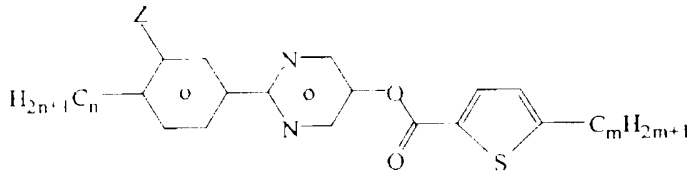
n	11	12	13	14	13	14	12	13	14	13	14	10	11	12	13	14	13	14	9	10	11	12	13	10
m	5	5	5	5	6	6	7	7	7	8	8	9	9	9	9	9	10	10	11	11	11	11	11	12
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

n	11	12	13	14	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	8	8	
m	12	12	12	12	4	5	6	7	8	9	10	11	12	4	5	6	7	8	9	10	11	12	4	6
X	-	-	-	-	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	8	8	8	8	9	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10	11	11	11	11
m	8	10	11	12	4	5	6	8	9	10	11	12	4	5	7	8	9	10	11	12	4	5	6	7
X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

n	11	11	11	11	11	12	12	12	12	12	12	12	12
m	8	9	10	11	12	5	6	7	8	9	10	11	12
X	O	O	O	O	O	O	O	O	O	O	O	O	O

compounds of the formula (XXXII), where:



5

n	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7	7	7	7
m	2	3	4	5	6	7	8	9	2	3	4	5	6	7	8	9	2	3	4	5

n	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	10	10	10	10	10
m	6	7	8	9	2	3	4	5	6	7	8	9	2	3	4	5	6	7	8	9	2	3	4	5	6

n	10	10	10	11	11	11	11	11	11	11	11	12	12	12	12	12	12	12	12	13	13	13			
m	7	8	9	2	3	4	5	6	7	8	9	2	3	4	5	6	7	8	9	2	3	4			

n	13	13	13	13	13	14	14	14	14	14	14	14	14
m	5	6	7	8	9	2	3	4	5	6	7	8	9

and where Z is H or F in all cases.